AMENDMENTS

In the Claims

1.   (**Currently Amended**) A method of processing a packet comprising:
creating a plurality of multi-feature packet processing rules, wherein

   said creating comprises, for each multi-feature packet processing rule of said
      multi-feature packet processing rules,
      forming said each multi-feature packet processing rule by merging a
         plurality of features from a feature hierarchy,
   each of said features is defined in said feature hierarchy, and
   at least one of said features in said feature hierarchy comprise another of
      said features in said feature hierarchy, and
populating [[a]] **said** plurality of multi-feature packet processing rules in a multi-feature
   classification memory; and
populating an associated content-addressable memory with a plurality of indices, wherein
   said indices are indices of said plurality of multi-feature packet processing rules in
      said multi-feature classification memory,
   said content-addressable memory and said multi-feature classification memory are
      associated with one another by virtue of said content-addressable memory
      being coupled to provide an index of said indices to said multi-feature
      classification memory, and
   each of said indices corresponds to at least one of said multi-feature packet
      processing rules.

2.   (Original) The method of claim 1, further comprising:
identifying a classification of said packet; and
using said classification to identify said multi-feature packet processing rule.

3.   (Original) The method of claim 2, wherein said classification is based on a
plurality of parameters of said packet.

4.   (Original) The method of claim 2, further comprising:

receiving said packet;

finding a match for said classification in said associated content-addressable memory;
and

receiving one of said indices from said associated content-addressable memory for one of
said multi-feature packet processing rules in said multi-feature classification
memory.

5.   (Original) The method of claim 4, further comprising:

using said index to receive said multi-feature packet processing rule from said multi-
feature classification memory.

6.   (Original) The method of claim 4, wherein said content-addressable memory is a
multi-feature content addressable memory.

7.   (Original) The method of claim 4, wherein said content-addressable memory is a
feature based content-addressable memory bank.

8.   **(Cancelled)**

9.   **(Currently Amended)** A method of processing a packet comprising:

identifying a classification of said packet in a content-addressable memory;

causing said content-addressable memory to provide an index of a plurality of indices to a
multi-feature classification memory, wherein said index corresponds to said
classification; and

locating a multi-feature packet processing rule in a multi-feature classification memory,
wherein
        said multi-feature packet processing rule is created by
                forming said multi-feature packet processing rule by merging a
                plurality of features from a feature hierarchy,
        each of said features is defined in said feature hierarchy,

at least one of said features in said feature hierarchy comprise another of

said features in said feature hierarchy,

said locating uses said index, and

said content-addressable memory and said multi-feature classification memory are

coupled to one another by virtue of said content-addressable memory

being coupled to provide said index to said multi-feature classification

memory.

10. (Original) The method of claim 9, further comprising:

processing said packet according to said multi-feature packet processing rule.

11. (Original) The method of claim 9, wherein said classification is based on a plurality of parameters of said packet.

12. (Previously Presented) The method of claim 10, further comprising:

receiving said packet;

finding a match for said classification in said content-addressable memory; and

receiving said index from said content-addressable memory for said multi-feature packet

processing rule in said multi-feature classification memory.

13. (Original) The method of claim 12, further comprising:

using said index to receive said multi-feature packet processing rule from said multi-

feature classification memory.

14. (Original) The method of claim 12, wherein said content-addressable memory is a multi-feature content addressable memory.

15. (Original) The method of claim 12, wherein said content-addressable memory is a feature based content-addressable memory bank.

16. (Cancelled)

17. **(Currently Amended)** A packet processing rule lookup system for processing a packet, comprising:

    a multi-feature classification memory, wherein

        said multi-feature classification memory is configured to store a plurality of multi-feature packet processing rules,

        each of said multi-feature packet processing rules comprises ~~a merged set of packet processing rules for at least one of a plurality of features~~ <u>a merged set of features,</u>

        <u>said merged set of features comprise a plurality of features from a feature hierarchy,</u>

        <u>each of said features is defined in said feature hierarchy,</u>

        <u>at least one of said features in said feature hierarchy comprise another of said features in said feature hierarchy</u>, and

        said each of said multi-feature packet processing rules ~~allows~~ <u>is configured to allow</u> said packet to be processed with regard to a set of said features corresponding to said each of said multi-feature packet processing rules; and

        said each of said multi-feature packet processing rules is formed

    a content-addressable memory coupled to said multi-feature classification memory, wherein

        said content-addressable memory is configured to store a plurality of indices, and

        each of said indices corresponds to at least one of said plurality of said multi-feature packet processing rules.

18. **(Original)** A network element comprising the packet processing rule lookup system of claim 8.

19. **(Original)** The network element of claim 18, further comprising:

    a processor coupled to said multi-feature classification memory, said processor is configured to process a plurality of packets according to said plurality of packet processing rules.

20.   (Original) The network element of claim 19, further comprising:

a network interface coupled to said processor, said network interface is configured to

provide input output interface for said network element; and

a memory coupled to said processor, said memory is configured to store information.

21.   (Original) The network element of claim 19, wherein said content-addressable memory is a multi-feature content addressable memory.

22.   (Original) The network element of claim 19, wherein said content-addressable memory is a feature based content-addressable memory bank.

23.   **(Cancelled)**

24.   **(Currently Amended)** A network element comprising:

means for creating a plurality of multi-feature packet processing rules, wherein

said means for creating comprises, for each multi-feature packet processing

rule of said multi-feature packet processing rules,

means for forming said each multi-feature packet processing rule by

merging a plurality of features from a feature hierarchy,

each of said features is defined in said feature hierarchy, and

at least one of said features in said feature hierarchy comprise another of

said features in said feature hierarchy, and

means for populating [[a]] said plurality of multi-feature packet processing rules in a

multi-feature classification memory; and

means for populating an associated content-addressable memory with a plurality of

indices, wherein

said indices are indices of said plurality of multi-feature packet processing rules in

said multi-feature classification memory,

said content-addressable memory and said multi-feature classification memory are

associated with one another by virtue of said content-addressable memory

being coupled to provide an index of said indices to said multi-feature

classification memory, and

each of said indices corresponds to at least one of said multi-feature packet processing rules.

25.   (Original) The network element of claim 24, further comprising:

means for identifying a classification of said packet; and

means for using said classification to identify said multi-feature packet processing rule.

26.   (Original) The network element of claim 25, wherein said classification is based on a plurality of parameters of said packet.

27.   (Original) The network element of claim 25, further comprising:

means for receiving said packet;

means for finding a match for said classification in said associated content-addressable memory; and

means for receiving one of said indices from said associated content-addressable memory for one of said multi-feature packet processing rules in said multi-feature classification memory.

28.   (Original) The network element of claim 27, further comprising:

means for using said index to receive said multi-feature packet processing rule from said multi-feature classification memory.

29.   (Original) The network element of claim 27, wherein said content-addressable memory is a multi-feature content addressable memory.

30.   (Original) The network element of claim 27, wherein said content-addressable memory is a feature based content-addressable memory bank.

31.   **(Cancelled)**

32.   **(Currently Amended)** A network element comprising:

a content-addressable memory;

means for identifying a classification of said packet in said content-addressable memory;

means for causing said content-addressable memory to provide an index of a plurality of indices to a multi-feature classification memory, wherein said index corresponds to said classification; and

means for locating a multi-feature packet processing rule in a multi-feature classification memory, wherein

said means for locating comprises a means for forming said multi-feature packet processing rule,

said means for forming comprises means for merging a plurality of features from a feature hierarchy,

each of said features is defined in said feature hierarchy,

at least one of said features in said feature hierarchy comprise another of said features in said feature hierarchy,

said **means for** locating ~~uses~~ **is configured to use** said index, and

said content-addressable memory and said multi-feature classification memory are coupled to one another by virtue of said content-addressable memory being coupled to provide said index to said multi-feature classification memory.

33.   (Original) The network element of claim 32, further comprising:

means for processing said packet according to said multi-feature packet processing rule.

34.   (Original) The network element of claim 32, wherein said classification is based on a plurality of parameters of said packet.

35.   (Previously Presented) The network element of claim 33, further comprising:

means for receiving said packet;

means for finding a match for said classification in said content-addressable memory; and

means for receiving said index from said content-addressable memory for said multi-feature packet processing rule in said multi-feature classification memory.

36.   (Original) The network element of claim 35, further comprising:

means for using said index to receive said multi-feature packet processing rule from said

        multi-feature classification memory.

37.   (Original) The network element of claim 35, wherein said content-addressable

memory is a multi-feature content addressable memory.

38.   (Original) The network element of claim 35, wherein said content-addressable

memory is a feature based content-addressable memory bank.

39.   **(Cancelled)**

40.   **(Currently Amended)** A computer program product comprising:

a set of instructions executable on a computer system, wherein

      said computer program product is configured to process a packet by virtue of said

            program product comprising said set of instructions, and

      said set of instructions is configured to

            create a plurality of multi-feature packet processing rules, wherein

                  said set of instructions configured to create comprises a subset

                      of instructions configured to, for each multi-feature

                      packet processing rule of said multi-feature packet

                      processing rules,

                      form said each multi-feature packet processing rule by

                          merging a plurality of features from a feature

                          hierarchy,

                  each of said features is defined in said feature hierarchy, and

                  at least one of said features in said feature hierarchy comprise

                      another of said features in said feature hierarchy,

           populate a plurality of multi-feature packet processing rules in a multi-

              feature classification memory, and

populate an associated content-addressable memory with a plurality of

indices, wherein

said indices are indices of said plurality of multi-feature packet

processing rules in said multi-feature classification

memory,

said content-addressable memory and said multi-feature

classification memory are associated with one another by

virtue of said content-addressable memory being coupled to

provide an index of said indices to said multi-feature

classification memory, and

each of said indices corresponds to at least one of said multi-

feature packet processing rules; and

computer readable storage media, wherein said computer program product is encoded in

said computer readable storage media.

41.   (Original) The computer program product of claim 40, wherein said set of
instructions is further configured to:

identify a classification of said packet; and

use said classification to identify said multi-feature packet processing rule.

42.   (Original) The computer program product of claim 41, wherein said classification
is based on a plurality of parameters of said packet.

43.   (Original) The computer program product of claim 41, wherein said set of
instructions is further configured to:

receive said packet;

find a match for said classification in said associated content-addressable memory; and

receive one of said indices from said associated content-addressable memory for one of

said multi-feature packet processing rules in said multi-feature classification

memory.

44.   (Original) The computer program product of claim 43, wherein said set of instructions is further configured to:

> use said index to receive said multi-feature packet processing rule from said multi-feature classification memory.

45.   (Original) The computer program product of claim 43, wherein said content-addressable memory is a multi-feature content addressable memory.

46.   (Original) The computer program product of claim 43, wherein said content-addressable memory is a feature based content-addressable memory bank.

47.   **(Cancelled)**

48.   **(Currently Amended)** A computer program product comprising:
a set of instructions executable on a computer system, wherein

> said computer system comprises a content addressable memory,
>
> said computer program product is configured to process a packet by virtue of said program product comprising said set of instructions, and
>
> said set of instructions is configured to
>
> > identify a classification of said packet in said content-addressable memory,
> >
> > causing said content-addressable memory to provide an index of a plurality of indices to a multi-feature classification memory, wherein said index corresponds to said classification, and
> >
> > locate a multi-feature packet processing rule in a multi-feature classification memory, wherein
> >
> > > **said multi-feature packet processing rule is created by**
> > >
> > > > **forming said multi-feature packet processing rule by merging a plurality of features from a feature hierarchy,**
> > >
> > > **each of said features is defined in said feature hierarchy,**

> **at least one of said features in said feature hierarchy comprise another of said features in said feature hierarchy,**
>
> said locating uses said index, and
>
> said content-addressable memory and said multi-feature classification memory are coupled to one another by virtue of said content-addressable memory being coupled to provide said index to said multi-feature classification memory; and

computer readable storage media, wherein said computer program product is encoded in said computer readable storage media.

49.   (Original) The computer program product of claim 48, wherein said set of instructions is further configured to:

processing said packet according to said multi-feature packet processing rule.

50.   (Original) The computer program product of claim 48, wherein said classification is based on a plurality of parameters of said packet.

51.   (Previously Presented) The computer program product of claim 49, wherein said set of instructions is further configured to:

receive said packet;

find a match for said classification in said content-addressable memory; and

receive an index from said content-addressable memory for said multi-feature packet processing rule in said multi-feature classification memory.

52.   (Original) The computer program product of claim 51, wherein said set of instructions is further configured to:

use said index to receive said multi-feature packet processing rule from said multi-feature classification memory.

53.   (Original) The computer program product of claim 51, wherein said content-addressable memory is a multi-feature content addressable memory.

54.   (Original) The computer program product of claim 51, wherein said content-addressable memory is a feature based content-addressable memory bank.

55.   **(Cancelled)**

56.   (Previously Presented) The method of claim 1, further comprising:

retrieving a one of said plurality of indices stored in an entry of said associated content-
        addressable memory by accessing said entry of said associated content-
        addressable memory, wherein
        said one of said plurality of indices is stored in said entry of said associated
            content-addressable memory; and

accessing a one of said plurality of multi-feature packet processing rules in said multi-
        feature classification memory using said one of said plurality of indices, wherein
        said one of said plurality of indices corresponds to said one of said plurality of
            multi-feature packet processing rules.

57.   (Previously Presented) The method of claim 9, wherein

said identifying generates an index, and

said locating uses said index to locate said multi-feature packet processing rule.

58.   (Previously Presented) The network element of claim 17, wherein

said content-addressable memory is configured to provide a one of said plurality of
        indices to said multi-feature classification memory, in response to an entry of said
        associated content-addressable memory being accessed, wherein
        said one of said plurality of indices is stored in said entry of said associated
            content-addressable memory, and

said multi-feature classification memory is configured to produce a one of said plurality
        of packet processing rules for said plurality of features, in response to receiving
        said one of said plurality of indices, wherein

said one of said plurality of packet processing rules for said plurality of features corresponds to said one of said plurality of indices.